CLASS: BIOLOGY

UNIT: THE CELL

TOPIC: CELL ORGANELLES: “THERE’S ALWAYS ROOM FOR JELLO”

**CONTEXT OF THE LESSON:**

**SUMMARY**: This lesson addressed the organelles that make up both the plant and animal cells. The students will learn the function of each organelle plays in keeping the cell running and also which organelles are only found in the animal cell and those in the plant cell.

**Day one** will consist of a power point presentation outlining the different organelles, there functions, and what they look like. I will attempt, through class discussion, to make connections such as making up mnemonics, silly sayings, or just connections to everyday life in order to help the students remember the function of each organelle. This part of the lesson will not be rushed because I feel it is extremely important for students to get a solid handle and feel comfortable with the various organelles of both the plant and animal cell. This is because as this unit progresses and also as they move on to higher level biology classes, the important reactions and cycles, (mitosis, meiosis, Krebs cycle, etc) are performed by one or more of these organelles, and it will be so much easier for them to grasp those concepts if they already know the functions of those organelles. After I feel that the students have a good handle on the information we will proceed to play a game. I will break the class up into their lab groups and from there I will then either display a picture, say one of the connections we came up with, describe a function, or just ask a question. The first person to raise their hand and answer correctly will receive a point for their group. Assuming we have enough time left, each student will only be able to answer 2 questions correctly. At that point he/she will still be allowed to participate in the group discussions. The group with the most points “wins” (receives a sticker, candy, something along those lines), also the number of points received will be considered bonus points and added to the unit test. If a group receives no points I will give them a point if I observed them having meaningful discussions and they were actively participating in the game. For homework I will pass out the lab instructions along with a worksheet to ensure they have read it. If they do not turn in this worksheet they will not be able to participate in the lab and will be given an alternate assignment related to the topic.

**Day two** will be a lab relating to the animal cell. This is an individual project where the students will construct a 3D model of the animal cell using jello and various candies that will represent the organelles. I will not instruct them on which candies should be used for what organelle and they will not have a list or diagram indicating the organelles. Each student will then have to write down in their lab notebook the organelle, its function, what candy they chose to represent that organelle, and why they chose it. They will also have to indicate what the jello itself represents and why. They are also to identify the organelles that are only found in the animal cell. When they are done they may if they chose eat their cell. Lab notebooks will be handed in.

**Day three** the students will create a 3D model of a plant cell using various common materials I will provide, (cotton balls, string, construction paper, cardboard, etc). Each organelle will need to either be lettered or numbered and include on a separate piece of paper the organelle that is represented by each letter/number. This will also include the function of each organelle and identify which organelles are only present in the plant cell.

**Context:** This is the sixth lesson in this unit. We have already been introduced to a number of the organelles from previous chapters and also through the vocabulary. We have also had the opportunity to view cells either through pictures or using the microscope.

**Timing:** This lesson will take place over 3 days which each class being 45min.

**INSTRUCTIONAL OBJECTIVES: STUDENTS WILL BE ABLE TO…**

1.) NAME ALL THE ORGANELLES IN THE PLANT AND ANIMAL CELL

2.) LIST THE ORGANELLES THAT ARE NOT SHARED BY BOTH CELLS AND IDENTIFY WHICH CELL IT BELONGS TO.

3.) DESCIBE THE FUNCTION OF EACH CELL ORGANELLE

4.) VISUALLY IDENTIFY EACH ORGANELLE

5.) CREATE A 3D MODEL OF THE PLANT AND ANIMAL CELL

**Learning Standards:**

**LS1 - All living organisms have identifiable structures and characteristics that allow for survival (organisms, populations, & species).**

***LS1 (9-11) INQ+SAE+FAF -1***

*Use data and observation to make connections between, to explain, or to justify how specific cell organelles produce/regulate what the cell needs or what a unicellular or multi-cellular organism needs for survival (e.g., protein synthesis, DNA replication, nerve cells).*

**LS1 (9-11)-1 Students demonstrate understanding of structure and function-survival requirements by**…

**1a** explaining the relationships between and amongst the specialized structures of the cell and their functions (e.g. transport of materials, energy transfer, protein building, waste disposal, information feedback, and even movement).

**Teaching Standards:**

RIBTS **Standard # 2:** Teachers create learning experiences that reflect an understanding of central concepts, structures, and tools of inquiry of the disciplines they teach

* **2.3** select instructional materials and resources based on their comprehensiveness, accuracy, and usefulness for representing particular ideas and concepts.

RIBTS **Standard # 4**: Teachers create instructional opportunities that reflect a respect for the diversity of learners and an understanding of how students differ in their approaches to learning.

* **4.2** use their understanding of students (e.g., individual interests, prior learning, cultural experiences) to create connections between the subject matter and student experiences.

RIBTS **Standard #5:** Teachers create instructional opportunities to encourage students’ development of critical thinking, problem solving, and performance skills.

* **5.5** use tasks that engage students in exploration, discovery, and hands-on activities

RIBTS: **Standard # 6:** Teachers create a learning environment that encourages appropriate standards of behavior, positive social interaction, active engagement in learning, and self-motivation.

* **6.3:** Organize and allocate the resources of materials and physical space to support active engagement of students.
* **6.4:** Provide and structure the time necessary to explore important concepts and ideas.

RIBTS: **Standard # 8**: Teachers use effective communication as the vehicle through which students explore, conjecture, discuss, and investigate new ideas.

* **8.1:** Use a variety of communication strategies (e.g., restating ideas, questioning, offering counter examples) to engage students in learning.
* **8.4:** Emphasize oral and written communication through the instructional use of

discussion, listening and responding to the ideas of others, and group interaction.

**Materials:**

**Day 1**

* Power point
* Laptop
* Projector
* Copies of lab instructions
* Worksheet for lab instructions

**Day 2**

* Jello ( premade in plastic cups)
* Various candies for organelles
* Plates
* Plastic knives (if allowed, if not?)
* Plastic spoons

**Day 3**

* Various materials to construct cell (cotton balls, string, Styrofoam, etc)
* Glue
* Markers
* Scissors
* Construction paper

**Internet Resources:**

* Lab 1: <http://www.accessexcellence.org/AE/ATG/data/released/0251-NickHoffman/>

(The instructions they will receive will have no pictures and no day before instructions)

**Assessment:**

Assessments will be made throughout the lessons. On day one, the game will act as a way for me to see who is comfortable with the information and who is still hesitant. This is done through observing the group discussions, who willingly offers an answer, and which answers seem to be providing the most difficulty. On day two, the 3D model itself will act as an assessment tool, in that they need to recall the various organelles, there function, and what they look like, on their own. Day three will also provide the same sort of assessment.